REMARKS

This Amendment is filed in response to the Office Action dated June 26, 2006. This application should be allowed and the case passed to issue. No new matter is raised by this amendment. The amendments to claims 1, 8, and 9 are supported by the specification at page 8, lines 14-25; page 9, lines 1-24; and Fig. 1. Claim 5 has been amended to maintain proper dependency. New claim 10 is supported by the specification at page 8, lines 14-18.

Claims 1-10 are pending in this application. Claims 1-9 were rejected. Claims 1, 5, 8, and 9 have been amended in this response. New claim 10 has been added in this response.

Objection to the Specification

The disclosure is objected to because it allegedly lacks appropriate spacing between words. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The disclosure has been reviewed and the spacing between the words appears to be proper. Applicants submit that the specification comports with the requirements of 37 C.F.R. § 1.52. If the Examiner maintains this objection it is respectfully requested that the Examiner specifically point out where the words are improperly spaced in the specification.

Objection to the Claims

Claims 1-9 are objected to because they allegedly lack appropriate spacing between words. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The claims have been reviewed and the spacing between the words appears to be proper. Applicants submit that the claims comport with the requirements of 37 C.F.R. §§ 1.52 and 1.75.

If the Examiner maintains this objection it is respectfully requested that the Examiner specifically point out where the words are improperly spaced in the claims.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-4, 6, and 8-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by Tamura et al. (U.S. Pat. Pub. No. 2003/0015995). This rejection is traversed, and reconsideration and withdrawal respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a battery pack malfunction detection apparatus that detects a malfunction in a battery pack constituted with a plurality of chargeable/dischargeable cells comprising malfunction detection devices. Each malfunction detection device is provided in correspondence to a predetermined number of cells to detect an overcharge malfunction in the corresponding predetermined number of cells during an overcharge detection period and to detect an over-discharge malfunction in the corresponding predetermined number of cells during an over-discharge detection period. A decision-making device makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices through a single signal line. The battery pack malfunction detection apparatus further comprise a clock signal generator and a switch. Each of the malfunction detection devices outputs a first signal if an overcharge malfunction is detected in any of the corresponding predetermined number of cells and outputs a second signal if no overcharge malfunction is detected during the overcharge detection period, outputs the second signal if an over-discharge malfunction is detected in any of the corresponding predetermined number of cells and outputs the first signal if no over-discharge malfunction is detected during

the over-discharge detection period. The clock signal generator controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device.

Another aspect of the invention, per claim 8, is a battery pack malfunction detection apparatus that detects a malfunction in a battery pack constituted with a plurality of chargeable/dischargeable cells comprising a plurality of malfunction detection means. Each malfunction detection means is provided in correspondence to a predetermined number of cells and detects an overcharge malfunction in the corresponding predetermined number of cells during an overcharge detection period and an over-discharge malfunction in the corresponding predetermined number of cells during an over-discharge detection period. A decision-making means makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection means through a single signal line. Each of the plurality of the malfunction detection means outputs a first signal if an overcharge malfunction is detected in any of the corresponding predetermined number of cells and outputs a second signal if no overcharge malfunction is detected during the overcharge detection period, outputs the second signal if an over-discharge malfunction is detected in any of the corresponding predetermined number of cells and outputs the first signal if no over-discharge malfunction is detected during the over-discharge detection period, and alternately outputs the output signal during the overcharge detection period and the output signal during the over-discharge detection period to the decision-making means through time sharing. A clock means generates a signal to control a switch means for switching between the first signal and the second signal.

Another aspect of the invention, per claim 9, is a battery pack malfunction detection method for detecting a malfunction in a battery pack constituted with a plurality of chargeable/dischargeable cells comprising generating a first signal upon detecting an overcharge malfunction in any of the cells and a second signal if no overcharge malfunction is detected during an overcharge detection period. A second signal is generated upon detecting an over-discharge malfunction in any of the cells and the first signal if no over-discharge malfunction is detected during an over-discharge detection period. The signal generated during the overcharge detection period and the signal generated during the over-discharge detection period are outputted alternately through time sharing through a single signal line. A switch is controlled to repeatedly select the first signal and the second signal in alternating sequence. A decision is made as to whether or not there is a cell manifesting an overcharge malfunction or an over-discharge malfunction based upon the signal output through time sharing.

The Examiner asserted that Tamura et al. disclose the claimed battery pack malfunction detection apparatus and method.

Tamura et al., however, do not suggest the claimed battery pack malfunction detection apparatus and battery pack malfunction detection method. Tamura et al. do not suggest a battery pack malfunction detection apparatus comprising a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices through a single signal line, a clock signal generator and a switch, wherein the clock signal generator controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device, as required by claim 1; a

decision-making means for making a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection means through a single signal line, and a clock means for generating a signal to control a switch means for switching between the first signal and the second signal, as required by claim 8; and a battery pack malfunction detection method comprising outputting the signal generated during the overcharge detection period and the signal generated during the over-discharge detection period alternately through time sharing through a single signal line, and controlling a switch to repeatedly select the first signal and the second signal in alternating sequence, as required by claim 9.

Tamura et al. disclose signals from the asserted malfunction detection means being input to a multiplexer 43 and from the multiplexer being input into a CPU 45. As is well known in this art, multiplexers combine multiple inputs into a single output transmitted simultaneously. Thus, Tamura et al. is quite different from the claimed apparatus and method, which requires a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices **through a single signal line**, a clock signal generator and a switch, wherein the clock signal generator **controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period** to the decision-making device, as required by claim 1; a decision-making means for making a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists **based upon a signal input from the malfunction detection means through a single signal line,** and a **clock means for generating a signal to control a switch**

means for switching between the first signal and the second signal, as required by claim 8; and a battery pack malfunction detection method comprising **outputting the signal** generated during the overcharge detection period and the signal generated during the over-discharge detection period **alternately through time sharing through a single signal line**, and **controlling a switch to repeatedly select** the first signal and the second signal in alternating sequence, as required by claim 9.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Tamura et al. do not disclose a battery pack malfunction detection apparatus comprising a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices through a single signal line, a clock signal generator and a switch, wherein the clock signal generator controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device, as required by claim 1; a decision-making means for making a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection

means through a single signal line, and a clock means for generating a signal to control a switch means for switching between the first signal and the second signal, as required by claim 8; and a battery pack malfunction detection method comprising outputting the signal generated during the overcharge detection period and the signal generated during the over-discharge detection period alternately through time sharing through a single signal line, and controlling a switch to repeatedly select the first signal and the second signal in alternating sequence, as required by claim 9, Tamura et al. do not anticipate claims 1, 8, and 9.

Applicants further submit that Tamura et al. do not suggest the claimed battery pack malfunction detection apparatuses and battery pack malfunction detection method.

Claim Rejections Under 35 U.S.C. § 103

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamura et al. in view of Fogg et al. (U.S. Pat. No. 6,836,095). This rejection is traversed, and reconsideration and withdrawal respectfully requested.

The Examiner acknowledged that Tamura et al. do not disclose the clock generation device that generates a clock signal. The Examiner asserted that Fogg discloses a clock generation device that generates a clock signal. The Examiner averred that it would have been obvious to substitute the clock signal of Fogg in the Tamura et al. device in order to provide periodic switching means from one mode to another.

The combination of Tamura et al. and Fogg, do not suggest the claimed battery pack malfunction apparatus. Fogg does not overcome the deficiencies of Tamura et al. Fogg does not suggest the battery pack malfunction detection apparatus comprising a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction

detection devices through a single signal line, a clock signal generator and a switch, wherein the clock signal generator controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device, as required by claim 1.

Fogg discloses a clock input 48 provides a periodic switching signal that drives switches S1 through S3 such that the input and output connections of the polarity switched amplifier A3 are periodically reversed (column 8, lines 40-44 and Fig. 4). Fogg does not suggest substituting a clock signal generator and switch into a battery pack malfunction apparatus constituting a plurality of cells comprising malfunction detection devices to detect overcharge and overdischarge malfunctions, as required by claim 1.

Obviousness can be established only by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Kotzab,* 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones,* 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine,* F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Although a reference can be modified, the prior art must suggest the desirability of modifying a reference. See *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no suggestion or motivation in Fogg to modify the apparatus of Tamura et al. to include a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices through a single signal line, a clock signal generator and a switch, wherein the clock signal generator controls the switch to repeatedly select output signal to the single signal line during the

overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device, as required by claim 1.

The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 is not an abstract concept, but must stem from the applied prior art as a whole and realistically impel one having ordinary skill in the art to modify a specific reference in a specific manner to arrive at a specifically claimed invention. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). Accordingly, the Examiner is charged with the initial burden of identifying a source in the applied prior art for the requisite realistic motivation. *Smiths Industries Medical System v. Vital Signs, Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999); *In re Mayne*, 104 F.3d 1339, 41 USPQ2d 1449 (Fed. Cir. 1997). There is no motivation in Fogg or Tamura et al. to modify the apparatus of Tamura et al. to include a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices through a single signal line, a clock signal generator and a switch, wherein the clock signal generator controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device, as required by claim 1.

The only teaching of a battery malfunction detection apparatus as required by claim 1 is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). It appears that the Examiner's conclusion of obviousness is based on impermissible

hindsight reasoning. The Examiner has not presented a prima facie case of obviousness for the instant claims. The Examiner's assertion of obviousness is clearly untenable and should be withdrawn.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamura et al. in view of Miyagi (U.S. Pat. Pub. No. 2004/0032238). This rejection is traversed, and reconsideration and withdrawal respectfully requested.

The combination of Tamura et al. and Miyagi, do not suggest the claimed battery pack malfunction apparatus. Miyagi does not overcome the deficiencies of Tamura et al. Miyagi does not suggest the battery pack malfunction detection apparatus comprising a decision-making device that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from each of the malfunction detection devices through a single signal line, a clock signal generator and a switch, wherein the clock signal generator controls the switch to repeatedly select output signal to the single signal line during the overcharge detection period and the output signal to the single signal line during the over-discharge detection period to the decision-making device, as required by claim 1.

The dependent claims are allowable for at least the same reasons as independent claim 1, and further distinguish the claimed invention. For example, new claim 10 requires that the clock signal generator generates a clock signal which is input to each malfunction detection device and the switch. The cited prior art does not suggest the claimed battery pack malfunction apparatus with these additional limitations.

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this

Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Bernard P. Codd

Bernard P. Codd
Registration No. 46,429

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 BPC:kap
Facsimile: 202.756.8087
Date: October 26, 2006

Please recognize our Customer No. 20277 as our correspondence address.